

Application No.: 10/064,830

Docket No.: JCLA9625

In The Claims:

1. (original) A battery with built-in load leveling, comprising:
 - a battery element;
 - a capacitor element;
 - an electronic controller to control complementary charge and complementary discharge between said battery element and said capacitor element;
 - a single housing to adapt said battery element, said capacitor element, and said controller to provide a hermetic encapsulation;
 - and
 - two terminals by one positive terminal and one negative terminal, on the exterior of said housing for charging and for discharging.
2. (original) The battery with built-in load leveling as claim 1, wherein said battery element includes a primary electrochemical cell selected from the group consisting of Zn/MnO₂, Zn/Ag₂O, and Zn-air batteries.
3. (original) The battery with built-in load leveling as claim 1, wherein said battery element includes a rechargeable electrochemical cell selected from the group consisting of lead-acid, nickel-cadmium, nickel-metal hydride, lithium ion, and lithium polymer batteries.

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4. (original) The battery with built-in load leveling as claim 1, wherein said capacitor element has an energy density of 0.15F per 1 cm² of electrode area or greater than 0.15 F/cm².
5. (original) The capacitor element as claim 4, wherein said capacitor includes an electrochemical cell selected from the group consisting of supercapacitor, ultracapacitor, and electric double layer capacitor.
6. (original) The battery with built-in load leveling as claim 1, wherein said battery element and said capacitor element both use the same aqueous electrolyte including one salt selected from the group consisting of KOH, NaOH, H₂SO₄, and H₃PO₄ dissolved in water.
7. (original) The battery with built-in load leveling as claim 1, wherein said battery element and said capacitor element both use the same organic solvent selected from the group consisting of acetonitrile, propylene carbonate, ethylene carbonate, diethyl carbonate, and dimethyl carbonate.
8. (original) The battery with built-in load leveling as claim 1, wherein said battery element and said capacitor element both use a polymeric electrolyte.

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9. (original) The battery with built-in load leveling as claim 1, wherein said controller regulates said battery element to discharge at 1C or a lower rate.
10. (currently amended) The battery with built-in load leveling as claim 1, wherein said controller regulates said capacitor element to provide a power ~~gap~~ difference between a load demand and a power provided by said battery element.
11. (currently amended) The battery with built-in load leveling as claim 1, wherein said controller regulates said capacitor element to extract ~~all~~ stored energy of said battery element ~~before arriving at a cut-off voltage of said battery element~~ until its voltage is not decayed below its cut-off voltage.
12. (currently amended) The battery with built-in load leveling as claim 1, wherein said controller regulates said capacitor element to receive a charging current of ~~any~~ a magnitude up to hundreds of Ampere without exceeding an open cell voltage of said capacitor element.
13. (currently amended) The battery with built-in load leveling as claim 1, wherein while in a charging mode, said controller ~~regulates said capacitor element to charge said battery element within an open cell~~

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~~voltage and an acceptable current level of said battery element~~
repeats a two-way charging sequence between said capacitor element
and said battery element until they are fully charged.